



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

09/813,767

03/21/2001

John C. Murphy

1414-SPL

2415

7590

11/13/2003

Francis A. Cooch, Office of Patent Counsel
The Johns Hopkins University
Applied Physics Laboratory
11100 Johns Hopkins Road
Laurel, MD 20723-6099

EXAMINER

STRECKER, GERARD R

ART UNIT

PAPER NUMBER

2862

DATE MAILED: 11/13/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/813,767

Applicant(s)

MURPHY, JOHN C.

Examiner

Gerard Strecker

Art Unit

2862

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 September 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-27 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 6, 10, 12-18, 24, 26 and 27 is/are allowed.
- 6) ☒ Claim(s) 1-5, 7-9, 11, 19-23 and 25 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

Art Unit: 2862

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 9/30/03 has been entered.

Claims 26, 27 are objected to because of the following informalities: In claim 26, it is not clear what "the" electrically conducting string refers to since claim 10 includes a plurality of strings. Appropriate correction is required.

Okamura disclosed (Fig. 1) a magnetometer comprising: a mechanically resonant electrically conducting string (4, for example) in the form of a light conducting fiber coated with an electrically conducting material, the string receiving a current (from AC current source 8); a light source (1) for inserting light into the fiber; and means (4-1 and 4-2) for supporting the string in tension at two locations. The magnetometer is placed in a magnetic field (11-1) to be detected, the magnetic field being perpendicular to the direction of the current and producing a Lorentz Force perpendicular to the string. By virtue of such arrangement Okamura's string would be capable of vibrating in any direction orthogonal to its axis such that deflection along multiple axes can be detected. Optical means (12, 13, etc) are provided for detecting deflection in the fiber. Okamura also discloses a plurality of magnetometers (4, 5, 6) joined end to end (claim 7).

Applicant argues that since Okamura discloses a two-beam interferometer and Applicant neither describes nor claims an interferometric magnetometer, Okamura cannot anticipate the

Art Unit: 2862

claims. The examiner respectfully disagrees with this conclusion. The claimed structure is disclosed by Okamura, and the fact that Okamura's magnetometer includes additional structure (reference arm fiber) for operation as an interferometer does not preclude the claims from being readable on, or anticipated by, the sensing arm portion of Okamura.

Claims 1-5; 7-9, 11, 19-23 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Okamura in view of Tangonan et al (4,348,587) or Giallorenzi (4,471,219).

Okamura is discussed above.

Tanganon et al discloses (Fig. 1) a magnetometer comprising: a light conducting fiber 11 coated with an electrically conducting material 11a. See col. 2, lines 15-56. When current is passed through the conducting material 11a and a magnetic field is applied to the coated fiber 11, phase or loss modulation of light passing through the light conducting fiber is detected as a measure of the current or of an unknown magnetic field (col. 4, lines 17-30). The magnetometer of Tangonan et al uses a single light beam and does not operate as an interferometer.

Giallorenzi discloses a magnetometer (magnetic head of Fig. 1) comprising: axially aligned optical transmission lines 12 and 14 having spaced ends 18 and 20, respectively. Application of a magnetic field to a magnetically sensitive coating 24 on end 18 causes motion of end 18 and modulation of the light passing through the transmission lines. The modulated light is detected as a measure of the magnetic field. See col. 2, line 36-col. 3, line 10. Giallorenzi's magnetometer uses a single light beam and is not used as an interferometer.

Art Unit: 2862


Assuming for purposes of argument that, because Okamura's magnetometer is used as an interferometer, the claims are not anticipated, it would nevertheless, have been obvious to one skilled in the art to adapt the magnetometer of Okamura for use in a non-interferometer mode by employing a single light beam, as taught by Tangonan et al and Giallorenzi. Such adaptation would enable the reference arm to be eliminated, thus reducing the number of parts and complexity and resulting cost of the magnetometer.

With respect to claims 4, 5, 8, 9, 21, 23 and 25, as indicated at page 5, lines 14-15, of the Okamura translation, appropriate supporting tensions for the fiber string are selected. Although Okamura does not show means for varying the tension of the string, in adapting Okamura's magnetometer to single light beam operation, it would have been obvious to include a string tension varying means with Okamura's magnetometer, as a necessary adjunct, for creating and maintaining a desired tension, to obtain optimum operation of the magnetometer. Piezo elements are conventionally employed for varying tension of strings in stringed devices.

Any inquiry concerning this communication should be directed to G. R. Strecker at telephone number (703) 305-4937.

G R STRECKER/pj

11/12/03


GERARD R. STRECKER
PRIMARY EXAMINER